Current Threat Environment

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Current Threat Environment

- Usual view of threat environment
- Looking backwards from today's threats
- Looking forwards to future threats
- The need for prevention is pressing

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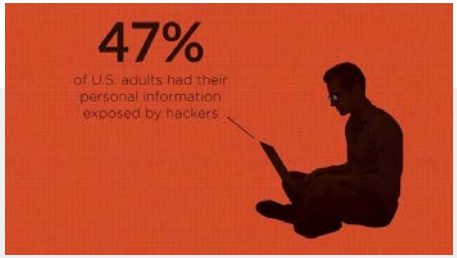
Usual view of threat environment



Sources: Poneman Institute, CNNMoney study, May 28, 2014; McAfee Quarterly Threat Report, June 2014; Wall Street Journal, Feb 26, 2014

retailcustomerexperience.com - 5_lessons_learned_from_recent_retail_data_breaches.pdf

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Looking backwards from today's threats

92% of the 100,000 incidents from the last 10 years can be described by 9 basic patterns

- Insider misuse
- DOS attacks
- Cyber-espionage
- Crimeware
- Web app attacks
- Physical theft and loss
- Payment card skimmers
- Point-of-sale intrusions
- Miscellaneous errors

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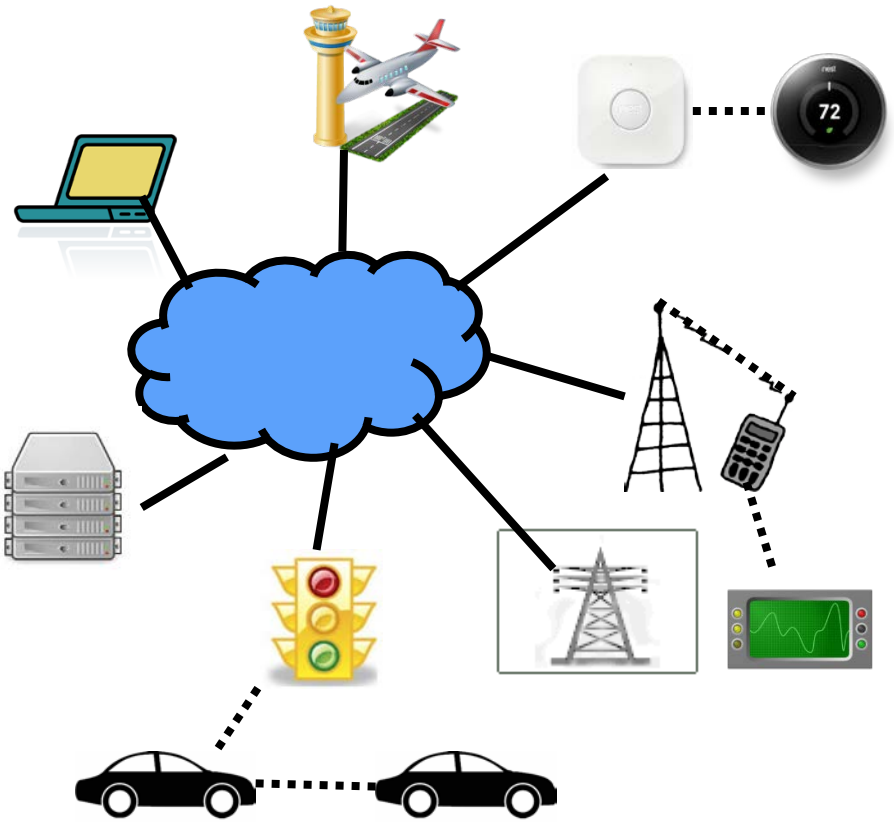
Looking forward to future threats

- Technology
- Evolving role of people in cyber security
- Learning from data: measurements, metrics, analysis

Cyber threats track evolution of technology



- Software is the new hardware
- Covering the next last mile
- Expanding endpoints

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Software is the new hardware

IT moving from specialized hardware to software, virtualized as

- Memory
- Storage
- Servers
- Switches
- Networks

Cyber-physical systems (CPS) evolving to a computer with interesting peripherals

- Airplane function in software moved from 8% to 80% since 1960
- Software defined radios drive communication
- Television evolved to digital signal processors

- Hardware security needs software analogs
- New programming models need secure coding guidelines
- Guard against side channel attacks enabled by virtualization

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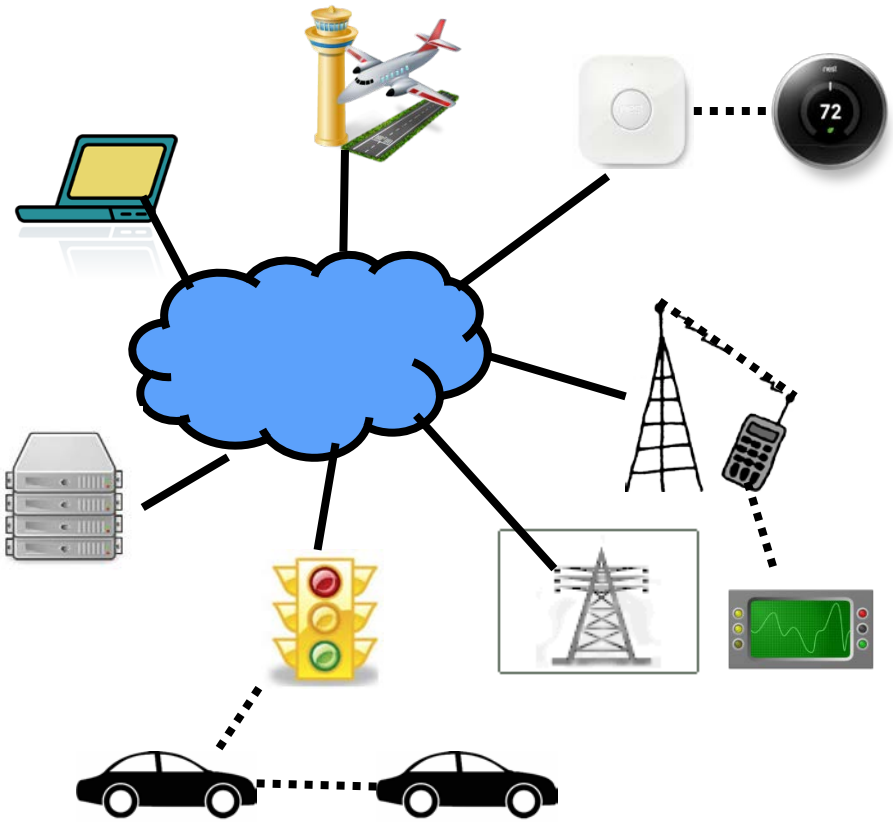
Covering the next last mile – securing the border and end points



The last mile has expanded to

- Cellular
  - Main processor
  - Base band processor
  - Secure element (SIM)
- Industrial and home automation
  - SCADA
  - Bluetooth
  - Zigbee
- Automotive
  - Intravehicular: more than 50 networked processors
  - Vehicle to infrastructure (V2I): congestion management, emergency services, law enforcement
  - Vehicle to vehicle (V2): safety, efficiency
- Aviation
  - Fly by wire
  - Next Gen air traffic control
- Smart grid
- Embedded medical devices

Evolving role of people in cyber security

Analysts: Soaring need for cyber analysts

- Bureau of Labor Statistics projects information security analyst jobs to increase by 20% or more through 2018
- Need validated measurement and testing of needed skills, at individual and team level

Optimizing analyst effectiveness: Automation assists analysts

- What can be automated and what left to the analyst
- Trade off between training and application

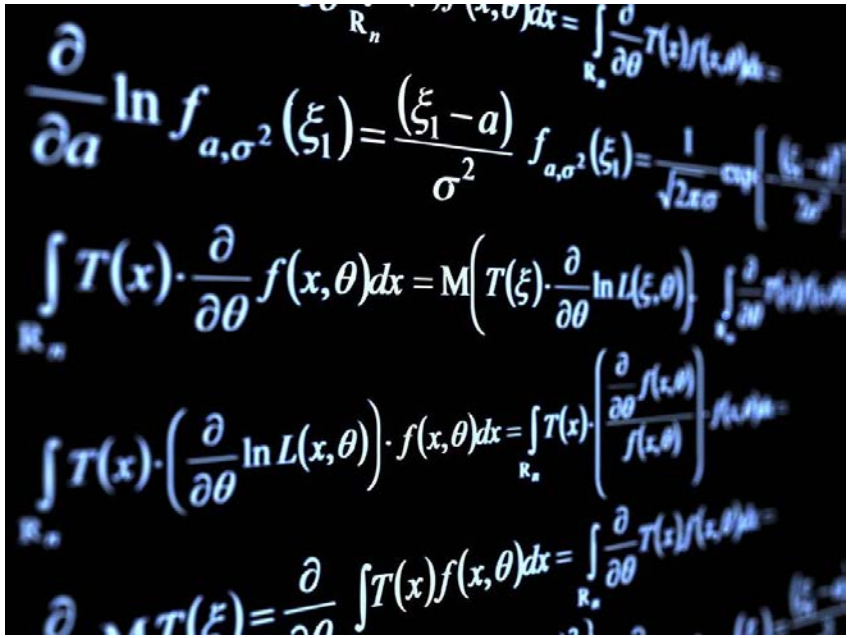
Developers: Development becoming assembly over creation

- At least 75% of organizations rely on open source as the foundation of their applications
- Weak or absent security tracking in the software supply chain

Adversaries: Culture role in cyber security

- Cultural influences on development and attack behavior

Learning from data: measurements, metrics, analysis



Biggest challenges

- **Determining leading indicators**
- **Reducing false positives**

Need to extract information from data from across the software lifecycle

Applying techniques across disciplines including

- Metric and model definition
- Social and psychological experimentation
- Machine learning
- Statistical modeling

Applications to

- Real-time analysis
- Retrospective insight

An ounce of prevention is worth a pound of cure

> “We wouldn't have to spend so much time, money, and effort on network security if we didn't have such bad software security.”

Bruce Schneier in Viega and McGraw,
“Building Secure Software,” 2001

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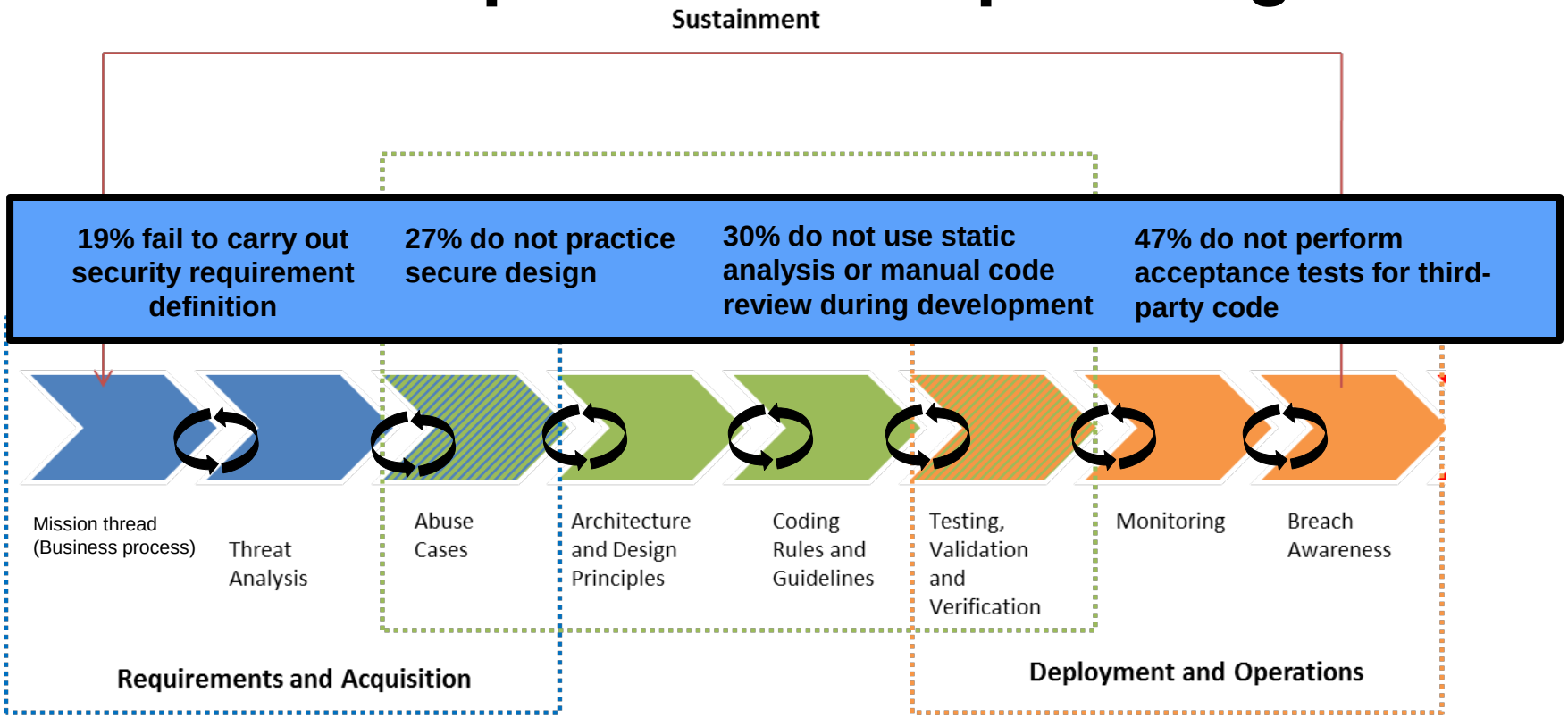
The need for prevention is pressing



More than 81% do not coordinate their security practices in various stages of the development life cycle.

Source: Forrester Consulting, “State of Application Security,” January 2011

Security by default

Contact Information

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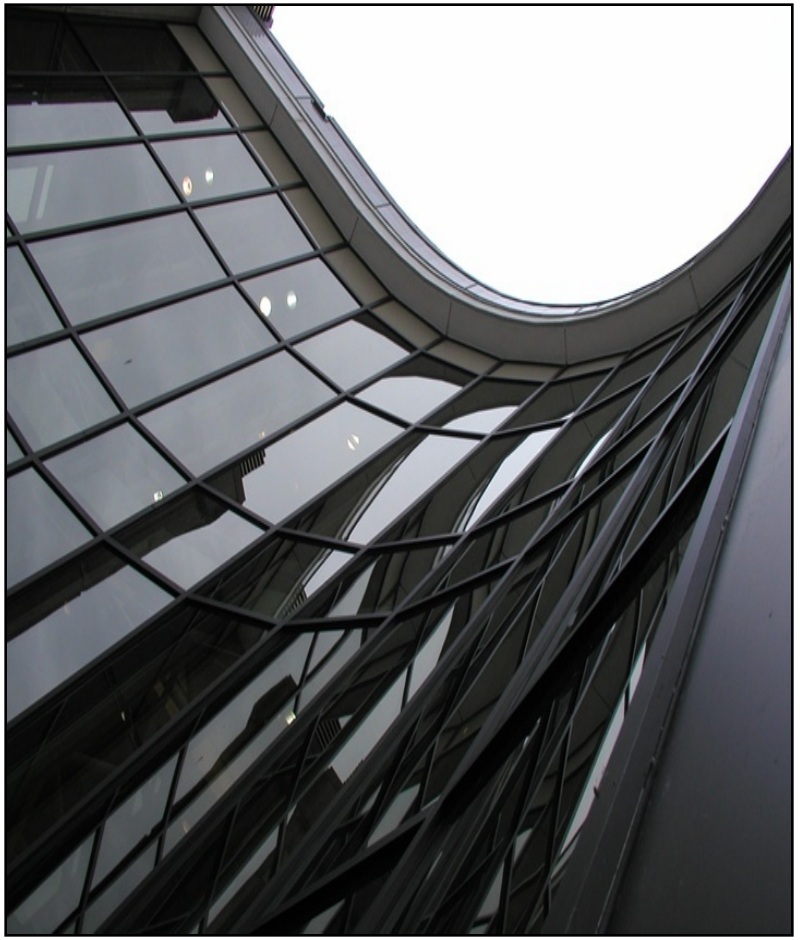
Web Resources (CERT/SEI)

http://www.cert.org/

http://www.sei.cmu.edu/



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